
To: Tom Harrigan
Village of Elm Grove

From: Richard Klein, PE

File: Underwood Creek Daylighting

Date: June 8, 2018

Reference: Update to 75% Complete Construction Drawings

The attached drawings provide updates to the recently submitted 75% Complete set of drawings. The following narrative provides responses to comments received from previous submittals.

Channel Design

- *The plan set should reflect the "normal" water level in the creek.*
 - The design is based on the bankfull or channel forming flows. This elevation is shown on the channel profile drawings. 'Normal' water level will vary but will often be lower than the bankfull level. The 'normal' flows will be conveyed in low flow meanders that form within the riffle sections of the channel.

- *What can be done to potentially increase the normal water level in order to mitigate any standing water and algae growth during the dry season?*
 - The channel is designed with an undulating bottom profile to provide a series of riffles and pools. The pools will contain water even during periods of low flow. Since the pools will be part of the active flow conveyance portion of the channel, the pooled water will be replenished by whatever flow the stream is experiencing.

- *The edge of the creek bank should have more stone incorporated in order to demonstrate the naturalized creek limit. The concept of Toe Wood was not well received and other options should be explored. However, it was acknowledged that habitat components should be included in order to qualify for possible granting opportunities.*
 - The creek bed riffles will consist of granular material, distinguishing the limits of the channel bed from the banks.
 - The toe wood details have been refined to more clearly show that the toe wood is largely below the water, with a vegetated bank higher up the slope. Toe wood provides excellent bank protection from erosive forces on outside bends, as well as superior habitat.

- *Is it possible to utilize stone weirs to create the pooling effects?*
 - The granular bed substrate essentially forms an in-stream stone weir at each pool location.

- *Is it possible to maintain a higher water level in stream channel?*
 - The design provides for a channel that will be stable over the range of anticipated flows, and includes pools at appropriate locations that will almost always contain water.

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- *Amount of rock along stream channel?*
 - The bed of the channel largely consists of granular/rocky material. Additional rock can be included along the channel if desired.
- *Inclusion of any toe wood south of Wall Street?*
 - Toe wood is included in the design south of Wall Street on outside channel bends.

Plantings

- *What kind of plantings will be incorporated into the plan?*
 - Two seed mixes along the channel are currently anticipated to be included in the project: A Wet Mesic mix for areas closer to the water, and an Upland Pollinator mix for area higher on the bank. These mixes are listed in Appendix A.

Erosion Control

- *What kind of bank erosion control will be implemented, erosion mats?*
 - Erosion mats or mulch, depending on the location (slope, proximity to channel).

Existing Culvert Abandonment

- *How will the existing culvert be filled? The concept of utilizing contaminated soil from the OHM property to fill the enclosed culvert is not an option. Perhaps utilizing compact stone is a better option.*
 - The existing culvert will be filled with compacted granular fill for those portions of the culvert currently beneath the parking lot. Soil from the OHM property will not be used to fill the culvert. Flowable fill will be used for those portions of the culvert beneath the Sendik's building.

Wall Street Bridge

- *Plaques are not needed, and the top stone cap on the pillars does not match the existing on Watertown Plank Road Bridge.*
- *The parapet walls are not needed, the railing will suffice.*
- *Bridge cross section: There should be a 6' sidewalk on both sides of the bridge and the drive lanes should be 10' wide (each).*
- *Reference to pillars on the bridge?*
 - Pillars similar to those on Watertown Plank Road will be included on both sides of the Wall Street bridge crossing. Railings will be included between the pillars.
 - The road section will consist of two 10-foot wide drive lanes bordered by 2-foot wide shoulders. A 6-foot wide sidewalk will be included on the north side of the road, with

Reference: Update to 75% Complete Construction Drawings

space for an additional 6-foot wide sidewalk to be constructed in the future in conjunction with corresponding required design modifications to the intersection further west.

Attachment: Revised Preliminary Construction Drawings

Appendix A

Elm Grove Underwood Creek Daylighting Seed Mixes

Wet Mesic Seed Mix		
Scientific Name	Common Name	Seeding Rate (oz/acre pls)
<i>Andropogon gerardii</i>	Big Bluestem	15.00
<i>Bouteloua curtipendula</i>	Side-oats Grama	10.00
<i>Bromus ciliatus</i>	Fringed Brome	5.00
<i>Calamagrostis canadensis</i>	Blue Joint Grass	0.75
<i>Elymus canadensis</i>	Canada Wild Rye	20.00
<i>Elymus riparius</i>	Riverbank Wild Rye	5.00
<i>Elymus virginicus</i>	Virginia Wild Rye	15.00
<i>Leersia oryzoides</i>	Rice Cut Grass	1.00
<i>Panicum virgatum</i>	Switch Grass	10.00
<i>Schizachyrium scoparium</i>	Little Bluestem	10.00
<i>Sorghastrum nutans</i>	Indian Grass	5.00
<i>Spartina pectinata</i>	Prairie Cord Grass	5.00
<i>Carex bebbii</i>	Bebb's Oval Sedge	1.00
<i>Carex vulpinoidea</i>	Brown Fox Sedge	1.00
<i>Juncus effusus</i>	Common Rush	0.25
<i>Juncus tenuis</i>	Path Rush	0.25
<i>Alisma subcordatum</i>	American Water Plantain	5.00
<i>Asclepias incarnata</i>	Swamp Milkweed	2.00
<i>Desmodium canadense</i>	Showy Tick Trefoil	1.00
<i>Doellingeria umbellata</i>	Flat-topped White Aster	0.50
<i>Eupatorium perfoliatum</i>	Boneset	0.50
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	0.50
<i>Eutrochium maculatum</i>	Joe Pye Weed	0.50
<i>Helenium autumnale</i>	Sneezeweed	1.00
<i>Helianthus grosseserratus</i>	Saw-tooth Sunflower	1.00
<i>Heliopsis helianthoides</i>	False Sunflower	5.00
<i>Lobelia siphilitica</i>	Great Blue Lobelia	0.25
<i>Monarda fistulosa</i>	Wild Bergamot	2.00
<i>Physostegia virginiana</i>	Obedient Plant	0.50
<i>Pycnanthemum virginianum</i>	Mountain Mint	0.50
<i>Rudbeckia hirta</i>	Black-eyed Susan	5.00
<i>Rudbeckia laciniata</i>	Wild Golden Glow	1.00
<i>Rudbeckia subtomentosa</i>	Sweet Black-eyed Susan	3.00
<i>Silphium laciniatum</i>	Compass Plant	2.00
<i>Silphium perfoliatum</i>	Cup Plant	3.00
<i>Solidago rigida</i>	Stiff Goldenrod	3.00
<i>Symphyotrichum laeve</i>	Smooth Blue Aster	2.00
<i>Symphyotrichum novae-angliae</i>	New England Aster	1.00
<i>Symphyotrichum pilosum</i>	Frost Aster	0.50
<i>Tradescantia ohioensis</i>	Ohio Spiderwort	1.50
<i>Verbena hastata</i>	Blue Vervain	2.00
<i>Vernonia fasciculata</i>	Common Ironweed	2.50
<i>Zizia aurea</i>	Golden Alexanders	4.00

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Upland Pollinator Mix		
Scientific Name	Common Name	Seeding Rate (oz/acre pls)
<i>Andropogon gerardii</i>	Big Bluestem	13.00
<i>Bouteloua curtipendula</i>	Side-oats Grama	10.00
<i>Elymus canadensis</i>	Canada Wild Rye	10.00
<i>Koeleria macrantha</i>	June Grass	1.00
<i>Panicum virgatum</i>	Switch Grass	5.00
<i>Schizachyrium scoparium</i>	Little Bluestem	15.00
<i>Sorghastrum nutans</i>	Indian Grass	5.00
<i>Sporobolus heterolepis</i>	Prairie Dropseed	5.00
<i>Juncus dudleyi</i>	Dudley's Rush	0.50
<i>Juncus tenuis</i>	Path Rush	0.20
<i>Agastache scrophulariaefolia</i>	Purple Giant Hyssop	1.00
<i>Allium cernuum</i>	Nodding Onion	3.00
<i>Amorpha canescens</i>	Lead Plant	2.50
<i>Asclepias incarnata</i>	Swamp Milkweed	1.00
<i>Asclepias syriaca</i>	Common Milkweed	2.50
<i>Asclepias tuberosa</i>	Butterfly Weed	1.00
<i>Baptisia alba</i>	White Wild Indigo	2.00
<i>Ceanothus americanus</i>	New Jersey Tea	0.20
<i>Chamaecrista fasciculata</i>	Partridge Pea	6.00
<i>Coreopsis lanceolata</i> var. <i>lanceolata</i>	Sand Coreopsis	3.00
<i>Dalea purpurea</i>	Purple Prairie Clover	7.00
<i>Eryngium yuccifolium</i>	Rattlesnake Master	6.00
<i>Helianthus occidentalis</i>	Western Sunflower	0.50
<i>Heliopsis helianthoides</i>	False Sunflower	5.00
<i>Lupinus perennis</i>	Wild Lupine	1.00
<i>Monarda fistulosa</i>	Wild Bergamot	2.00
<i>Monarda punctata</i>	Spotted Bee Balm	0.75
<i>Oenothera biennis</i>	Common Evening Primrose	1.25
<i>Penstemon digitalis</i>	Foxglove Beardtongue	1.50
<i>Pycnanthemum virginianum</i>	Mountain Mint	0.25
<i>Rudbeckia hirta</i>	Black-eyed Susan	2.00
<i>Rudbeckia subtomentosa</i>	Sweet Black-eyed Susan	1.50
<i>Scrophularia lanceolata</i>	Early Figwort	0.50

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<i>Silphium integrifolium</i>	Rosinweed	2.50
<i>Silphium laciniatum</i>	Compass Plant	2.50
<i>Solidago rigida</i>	Stiff Goldenrod	2.50
<i>Symphyotrichum lateriflorum</i>	Calico Aster	0.50
<i>Symphyotrichum novae-angliae</i>	New England Aster	1.50
<i>Symphyotrichum oolantangiense</i>	Sky Blue Aster	1.50
<i>Tradescantia ohioensis</i>	Ohio Spiderwort	4.00
<i>Verbena hastata</i>	Blue Vervain	3.00
<i>Zizia aurea</i>	Golden Alexanders	5.00